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Vol.40—No.248
12-24-75
PAGES
59421–59588

federal register

WEDNESDAY, DECEMBER 24, 1975

highlights

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National Bureau of Standards

COMPUTER OUTPUT MICROFORM FORMATS AND REDUCTION RATIOS

Proposed Federal Information Processing Standard

Under the provisions of Public Law 89–306 and Executive Order 11717, the Secretary of Commerce is authorized to establish uniform Federal ADP Standards. A proposed standard for Computer Output Microform Formats and Reduction Ratios is being recommended for Federal use. This proposed standard specifies the image arrangement, size and reduction ratios to be generated by Computer Output Microfilmers (COM).

In order to insure that all parties have a full opportunity to present their views, NBS is soliciting comments on the following Computer Output Microform Formats and Reduction Ratios Standard. This standard will be applicable to all COM systems generating information for conversion to microforms using business-oriented fonts. The microform formats and associated reduction ratios specified by this proposal will be the only formats and reduction ratios authorized for use within the Federal government and will be required for all new COM systems and applications.

The proposed Federal Information Processing Standard contains two basic sections: (1) an announcements section which provides information concerning the applicability, implementation and maintenance of the standard; and (2) a specification section which deals with the technical requirements of the standard. Both sections are provided in their entirety in this notice.

Interested parties may submit comments to the Associate Director for ADP Standards, Institute for Computer Sciences and Technology, National Bureau of Standards, Washington, D.C. 20234, on or before March 23, 1976.

Dated: December 17, 1975.

ERNEST AMBLER,
Acting Director.

Foreword. The use of microforms in the recording and dissemination of data and information is widespread in the Federal Government and the volume is steadily increasing, particularly for that information generated by computer. Therefore, the uniformity of Computer Output Microforms is essential in order to enhance the exchange and utilization of recorded information, and to provide compatibility of processing and user equipment. It is also essential that the number of different Computer Output Microform formats and reduction ratios be kept to a minimum in order to reduce the variety of equipment required. The Computer Output Microform Standards Group (TG–18) was formed by the Federal Information Processing Standards Coordinating and Advisory Committee (FIPSCAC) to standardize certain aspects of Computer Output Microforms to meet Federal agency needs. This standard has been developed and issued for this purpose.

FEDERAL INFORMATION PROCESSING STANDARDS PUBLICATION—1975

Announcing the Standard for Computer Output Microform Formats and Reduction Ratios

Federal Information Processing Standards Publications are issued by the National Bureau of Standards pursuant to the Federal Property and Administrative Services Act of 1949 as amended, Public Law 89–306 (79 Stat. 1127), Executive Order 11717 (38 FR 12315, dated May 11, 1973), and Part 6 of Title 15 CFR (Code of Federal Regulations).

Name of Standard. Computer Output Microform Formats and Reduction Ratios.

Category of Standard. Hardware Standard, Media.

Explanation. This standard specifies the image arrangement, size and reduction ratios to be generated by Computer Output Microfilmers (COM).

Approving Authority. Secretary of Commerce.

Maintenance Agency. Department of Commerce, National Bureau of Standards (Institute for Computer Sciences and Technology).

Applicability. This standard is applicable to all computer output microfilm systems generating information for conversion to microforms using business-oriented fonts.

New COM Systems and Applications. The microform formats and associated reduction ratios specified herein are the only formats and reduction ratios authorized for use within the Federal Government and are mandatory for all new COM systems and applications.

Existing COM Systems and Applications. Users of existing COM systems and applications are encouraged to comply with this standard. Systems and applications not in accordance with this standard shall be evaluated periodically by heads of departments or agencies and the merits of converting to the standard weighed.

Specification. Federal Information Processing Standard ____, Computer Output Microform Formats and Reduction Ratios (affixed).

Implementation Schedule. All microforms produced by or for Federal agencies and equipment or services acquired after the date of this FIPS PUB must be in conformance with the specifications contained herein. Exceptions to this standard are made in the following cases:

a. For microforms, equipment, or services produced, procured, or on order, prior to the date of this FIPS PUB.

b. Where procurement actions are into the solicitation phase (i.e., Requests for proposals or Invitations for Bids have been issued) on the date of this FIPS PUB.

Waiver Procedure. Heads of agencies may waive the provisions of the implementation schedule. Proposed waivers relating to the production or procurement of non-conforming microforms will be coordinated in advance with the National Bureau of Standards, Washington, D.C. 20234. They should describe the nature of the waiver and set forth the reasons therefor.

Sixty days should be allowed for review and response by the National Bureau of Standards. The waiver is not to be effective until a reply is received from the National Bureau of Standards; however, the final decision for the granting of a waiver is a responsibility of the agency head.

Where to Obtain Copies of the Standard.

a. Copies of this publication are available from the Superintendent of Documents, U.S Government Printing Office, Washington, D.C. 20420 (SD Catalog Number C13.52:____).

b. Microfiche of this publication is available from the National Technical Information Service, U.S. Department of Commerce, Springfield, Virginia 22151. Refer to Report Number NBS–FIPS–PUB–____ and title

FEDERAL INFORMATION PROCESSING STANDARDS ____ 1975

Specifications for Computer Output Microform Formats and Reduction Rates

1. *Name of Standard.* Computer Output Microform Formats and Reduction Ratios.

2. *Category of Standard.* Hardware Standard, Media.

3. *Explanation.* This standard specifies the image arrangement, size and reduction ratios to be generated by Computer Output Microfilmers (COM).

4. *Specifications.* This standard covers microform formats and reduction ratios for Computer Output Microforms (COM) using business-oriented fonts.

4.1 The choice of microform formats and associated reduction ratio(s), from among those specified herein, for use in a particular system or application is not prescribed by this standard. These choices will be based on user needs and developed from other criteria.

4.2. *Authorized Formats and Effective Reduction Ratios.*

a. 16mm roll film (24:1).
(1) Cine mode (IA).
(2) Comic mode (IB).

b. 105mm X 148mm microfiche.
(1) 63 frame (7 rows X 9 columns) 24:1.
(2) 98 frame (7 rows X 14 columns) 24:1.
(3) 270 frame (15 rows X 18 columns) 48:1.
(4) 420 frame (15 rows X 28 columns) 48:1.

4.3. *Requirements.*

a. *Legibility.* All characters must be recorded so they are readable by the user. This means that the quality of the master recordings must be sufficiently high to allow for the normal image degradation that results when making subsequent generation copies for the end user. Typically, there is about a 10% loss in the ability to duplicate very closely spaced points for each subsequent generation. The images of the smallest characters should measure at least 0.05 mm in height on the original microform. This represents a character height at an effective magnification of 24X of approximately 1.2 mm and at 48X of approximately 2.40 mm.

b. *Roll film.* See Formats 1 and 2.

c. *Microfiche.* See Formats 3 through 6.

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(1) *Pagination.* Either vertical or horizontal pagination will be used in the creation of microfiche. When the microfiche is oriented so that the designated header area is upright and right reading, the first data frame will be placed in the left most position of the row immediately below the header.

(a) *Vertical pagination.* Frames following the first data frame will appear in sequence from top to bottom through the rows and from left to right through the columns.

(b) *Horizontal pagination.* Frames following the first data frame will appear in sequence from left to right through the row and from top to bottom through the columns.

(c) *Identification.* When used, identification of the method of pagination will be through use of an arrow placed in the header area. Vertical pagination will be designated by an arrow pointed downwards (↓). Horizontal pagination will be designated by an arrow pointing to the right (→).

(2) *Identification of sensitized film side.*

(a) *Silver original.* When the microfiche is held so that the header is upright and right reading, the sensitized (emulsion) side will be away from the observer.

(b) *Pre-cut stock or duplicates.* The sensitized side shall be identified by one of the following methods.

1 Method A—When a sheet of raw film or a duplicate microfiche is held with the long sides in a vertical position and either the notch or the corner cut is in the upper right hand corner, the sensitized side will be towards the observer as specified in American National Standard, PH1.10–1969, *Designation of Emulsion Side of Photographic Sheet Film.*

2 Method B—When a sheet of raw film or a duplicate microfiche is held with the long sides in a horizonal position and the notch is in the lower right corner or the corner cut is in the upper left corner, the sensitized side is towards the observer.

(c) *Identification techniques.*

1 Corner Cutting—To identify the sensitized side of a microfiche, a corner cut may be placed in the upper left corner of the header area when the sensitized side is facing the observer and the header is at the top. The cut shall extend a nominal 6mm along the long dimension (top) and a nominal 9mm along the short dimension (left side) of the microfiche.

2 Notching—in lieu of a corner cut, a notch may be placed along the right short dimension (side) near the bottom, when the sensitized side is facing the observer and the header area is at the top. The notch may be of any shape but shall not penetrate more than 1.6mm inward from the edge.

(3) *Header area.* The header area constitutes the top of the microfiche. The minimum area reserved for the header shall be used only for header and identification purposes on all microfiche and shall not be used for microimages. If additional header space is required, the area dedicated to the next entire row or rows of images shall be used. When this option is utilized, row identification shall remain unchanged. All header characters shall be upright and right reading, and at least 2mm in height. All characters shall be readable without magnification. The minimum areas reserved for the header are indicated in the figures for the microfiche formats by shading.

(4) *Frame identification.* When coordinates are used to identify the location of images, alphabetic characters shall be used to identify rows. Starting at the top left corner, under the minimum header area, the first row of microimages shall be A, the next B, the next C, and so on. Columns shall be identified numerically. Starting at the left, the first column shall be 1, the second 2, and so on.

(5) *Index.* If an index to the microfiche is to be provided, the placement of the last microimage of the index shall be in the bottom right corner frame of the grid area.

(6) *Trailer identification.* When trailer microfiche are used, each mirficofiche in the set, including the first one, should be sequentially identified. This information shall appear in the right-most portion of the header area.

(7) *Cut mark.* A cut mark will be proided for automatic cutting of 105mm roll film into microfiche. This cut mark shall be 3.0mm × 3.0mm square and the center of the square shall be located 32mm± 0.2mm along the bottom edge from the reference corner of each microfiche area.

(8) *Squareness.* Each side of the microfiche shall be perpendicular to the bottom (reference) edge within ±0.13mm for each 25mm of height of the microfiche. The total deviation of the side edges from the perpendicular to the bottom (reference edge) shall not cause the length of the tow edge of the microfiche to exceed 148mm plus 0.0mm, minus 1.0mm.

(9) *Edge straightness.* Each of the four edges of a microfiche shall be capable of falling between two straight parallel lines 0.25mm apart.

(10) *Curl and bow.* The curl or bow of a sheet of microfiche, when placed convex side down on a flat surface for at least six hours in a 70°F., 50% relative humidity atmosphere, shall have no part of the microfiche more than 6.35mm above the surface. (See ANSI Standard PH1.29–1971, *Methods for Determining Curl of Photographic Film*).

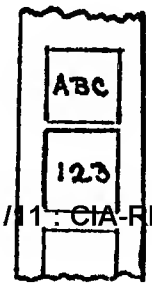
(11) *Corner rounding.* Where corner rounding is employed, the process shall not remove at any corner more than 3mm of either of the two sides which form the corner.

5. *Definitions.* Definitions needed for clarification of this standard are given in this section.

Application

Any use of COM that satisfies particular information requirements.

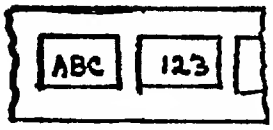
Cine (motion picture) oriented images (IA orientation) Jargon used with intent to reference images oriented on microfilm as follows, otherwise known as IA orientation.



Column. A vertical series of microimages on a microfiche.

COM. Computer Output Microform: Any microform containing images generated by a recorder, and duplicates thereof.

Comic strip oriented images (IB orientation) Jargon used with intent to reference images oriented on microfilm as follows, otherwise known as IB orientation.



Cut Mark. A mark added to film to permit automatic cutting of microfiche from a roll of film.

Format. A dimensioned layout containing requirements for size, arrangement and orientation of microimages upon a microform.

Frame. The total area allocated for exposure, regardless of whether or not this area is filled by the document or data image.

Header. Information, which is readable without magnification, placed at the top of a microfiche.

Microfiche. A sheet of film containing multiple microimages in a grid pattern.

Microfilm. (1) A high resolution film containing an image or images greatly reduced in size from the original. (2) To record microimages on film.

Microform. A generic term for any form containing microimages.

Microimage. A unit of information, such as a page of text or a drawing, too small to be read without magnification.

Micrographics. The science, art and technology of document and information miniaturization and associated microform systems.

Notch. Used to identify the sensitized side of a peace of photographic film.

Reduction, effective. A measure of the number of times a given linear dimension of a similar conventional document would be reduced to equal the size of the COM generated microimage.

Row. A horizontal series of microimages on microfiche.

Sensitized Side. The side of the microform coated with a photosensitive material.

Specification. A document which describes the essential and technical requirements for items, materials and services including procedures by which it will be determined that the requirements have been met.

Standard. A document that establishes engineering and technical limitations and applications for items, materials, processes, methods, designs and engineering practices.

System. (1) All the harware, software, microforms, etc. employed from production through utilization. (2) An assembly of elements used to fulfill an application requirement.

5. *Dimensioning.* The dimensions used in this standard are expressed in the metric system (SI), all dimensions shown being in millimeters. See FIPS Pub 34, *ANSI Metric Practice Guide* Z210.1 (ASTM E380–72).

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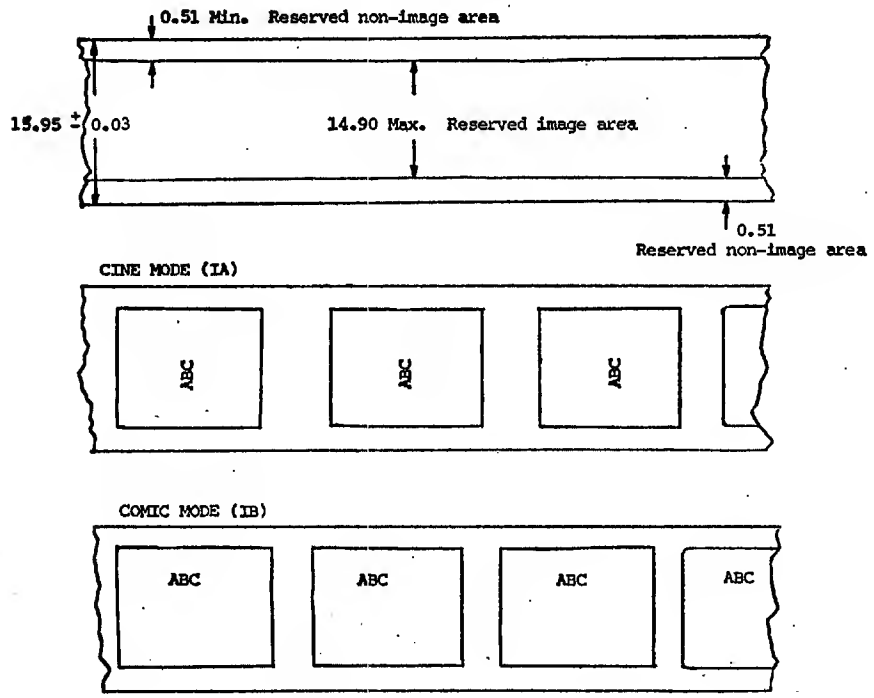
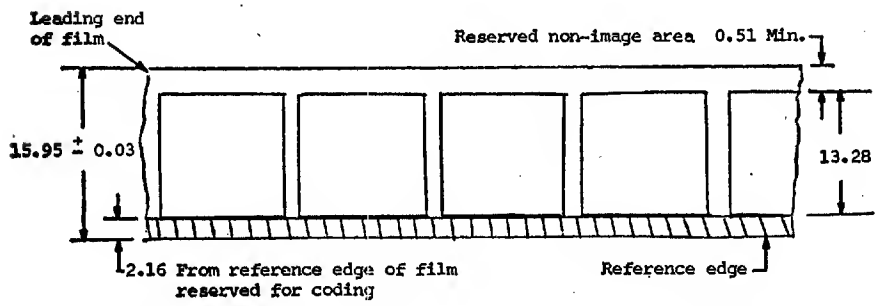
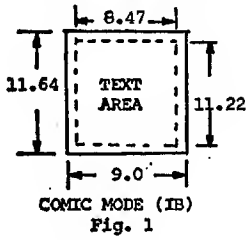
FORMAT 1. 16mm Roll Microfilm 24:1



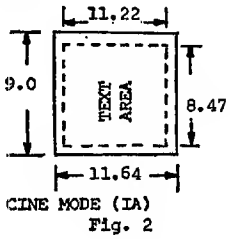
1. Effective reduction 24:1.
2. Dimensions in millimeters.

FORMAT 2. 16mm Roll Microfilm, Document Mark (Blip), 24:1

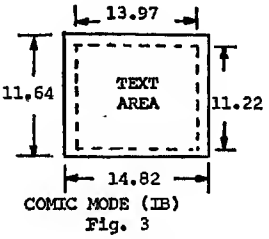




COMIC MODE (IB)
Fig. 1



CINE MODE (IA)
Fig. 2



COMIC MODE (IB)
Fig. 3

1. Effective reduction 24:1.
2. Dimensions in millimeters.
3. The text area shown in figure 1 and 2 represents the data placed on a 216.0mm x 279.4mm (8.5 x 11 in) page (typically 64 lines of 80 characters).
4. The text area shown in figure 3 represents the data placed on a 355.6mm x 279.4mm (14 x 11 in) page (typically 64 lines of 132 characters).

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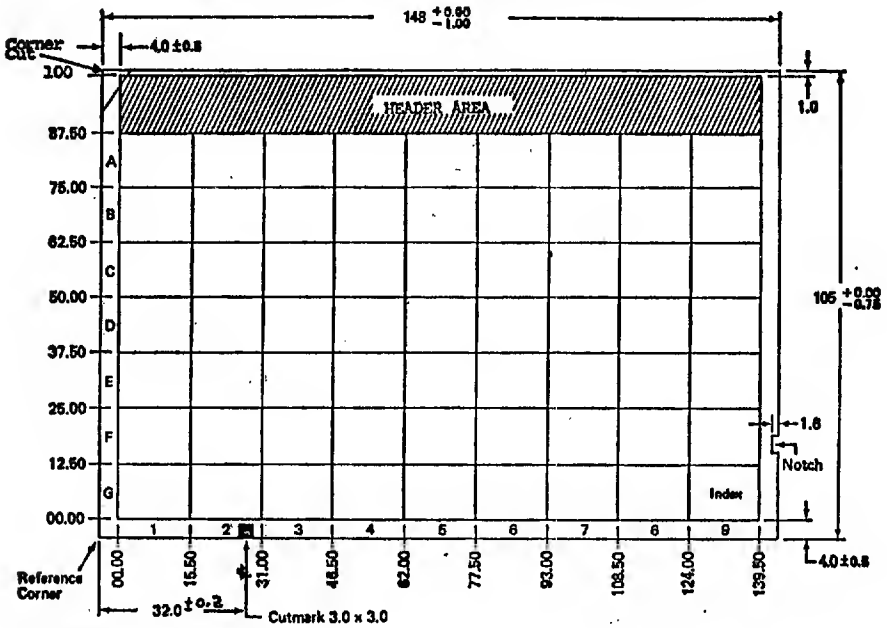
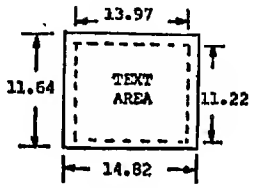
FORMAT 3. Microfiche 63 Frame (7 Rows X 9 Columns) 24:1



1. Effective Reduction 24X.
2. Dimensions in millimeters.
3. Grid lines shown do not appear on microfiche.
4. With the notch and corner cut in the positions shown on this drawing the sensitized side is facing the observer.



The text area shown represents the data placed on a 355.6mm x 279.4mm (14 x 11 in) page (typically 64 lines of 132 characters).

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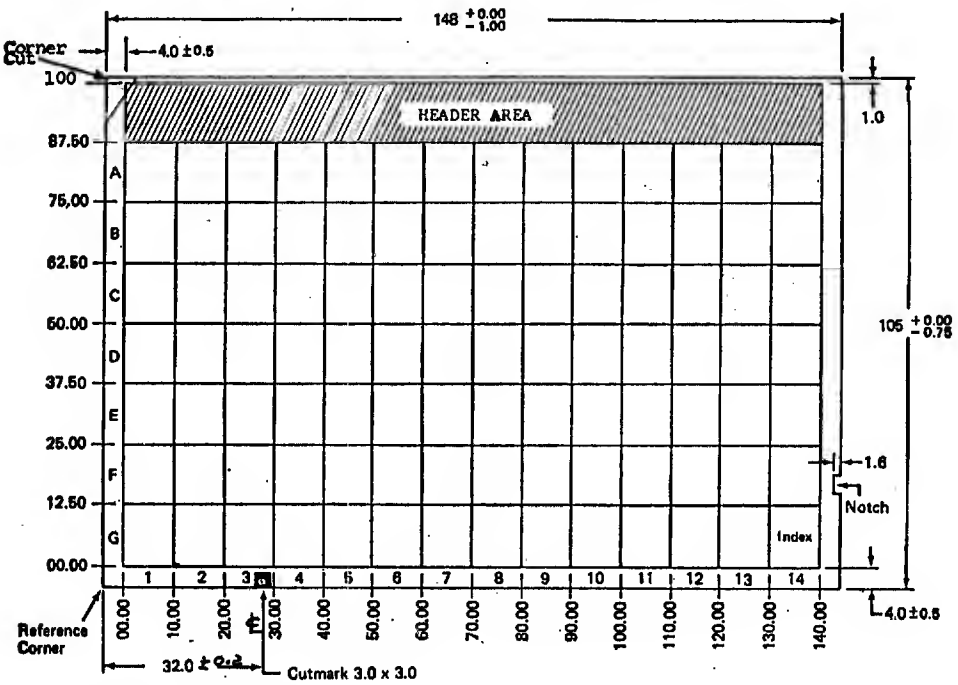
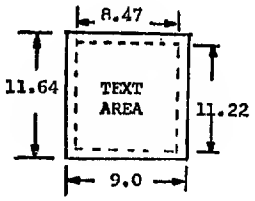
FORMAT 4. Microfiche 98 Frame (7 Rows X 14 Columns) 24:1



1. Effective Reduction 24X.
2. Dimensions in millimeters.
3. Grid lines shown do not appear on microfiche.
4. With the notch and corner cut in the positions shown on this drawing the sensitized side is facing the observer.



The text area shown represents the data placed on a 216.0mm x 279.4mm (8.5 x 11 in) page (typically 64 lines of 80 characters).

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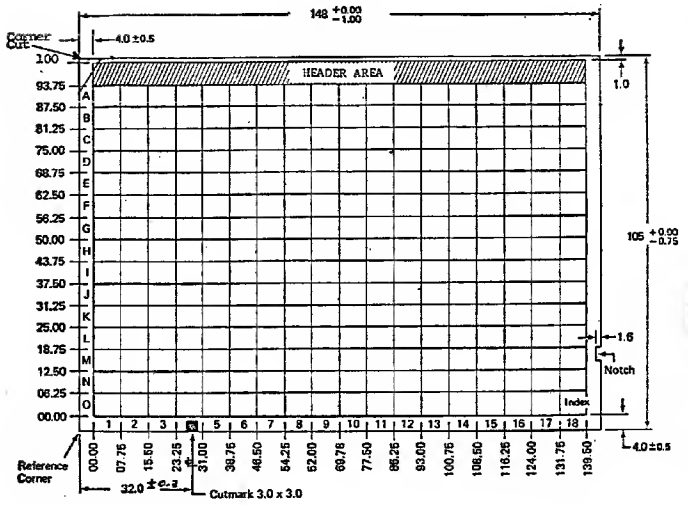
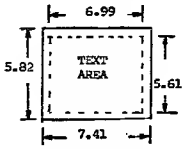
FORMAT 5. Microfiche 270 Frame (15 Rows X 18 Columns) 48:1

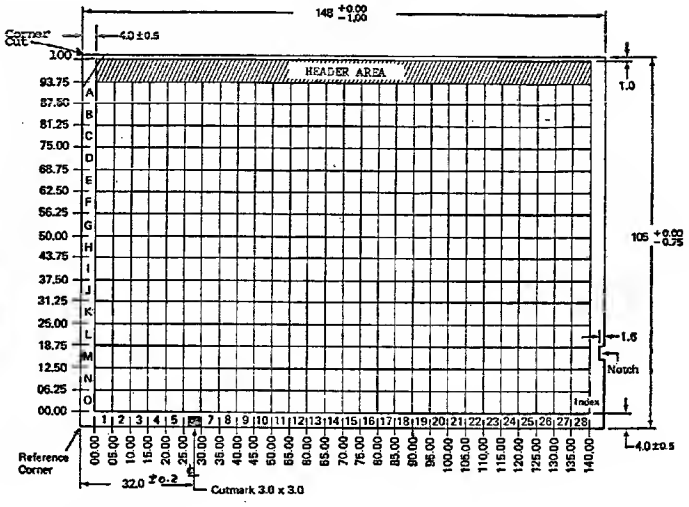


1. Effective Reduction 48X.
2. Dimensions in millimeters.
3. Grid lines shown do not appear on microfiche.
4. With the notch and corner cut in the positions shown on this drawing the sensitized side is facing the observer.

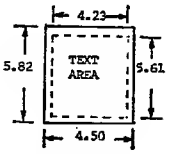


The text area shown represents the data placed on a 355.6mm x 279.4mm (14 x 11 in) page (typically 64 lines of 132 characters).

FORMAT 6. Microfiche 420 Frame (15 Rows X 28 Columns) 48:1



1. Effective Reduction 48X.
2. Dimensions in millimeters.
3. Grid lines shown do not appear on microfiche.
4. With the notch and corner cut in the positions shown on this drawing the sensitized side is facing the observer.



The text area shown represents the data placed on a 216.0mm x 279.4mm (8.5 x 11 in) page (typically 64 lines of 80 characters).

[FR Doc.75-34531 Filed 12-23-75;8:45 am]

USCOMM-NBS-DC

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